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ABSTRACT

In 1990, the Kentucky legislature established the Education Professional Standards Board as part of a systemic program of educational improvement. This report was commissioned to facilitate discussions about how best to configure certification requirements and related professional development activities. The first three sections identify, review, and analyze the professional knowledge base regarding learning development, the learning needs of children in each developmental stage, the role of field experiences in professional education, and certification trends in the states. The last section suggests policy options supported by the knowledge base and describes issues that will arise as new policies are implemented. The document concludes with nine policy recommendations which include improving internship, developing and implementing performance-based assessments, and designing effective recruitment strategies. Three tables provide information on selected developmental events that affect teaching and learning; National Board for Professional Teaching Standards certification levels and specialties; and certification levels and specialties recommended for Kentucky. (Contains 70 references.) (LL)

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POLICY ISSUES

THE PROFESSIONALIZATION OF TEACHING: CENTERPIECE OF KENTUCKY REFORM

BY

MARY S. LEIGHTON

AND

GARY SYKES

PUBLISHED BY:

STATE POLICY PROGRAM
APPALACHIA EDUCATIONAL LABORATORY
CHARLESTON, WEST VIRGINIA

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The Professionalization of Teaching: Centerpiece of Kentucky Reform

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Mary S. Leighton

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Gary Sykes

Published By:

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THE PROFESSIONALIZATION OF TEACHING: CENTERPIECE OF KENTUCKY REFORM

Mary S. Leighton
Gary Sykes

September 1992

This report was prepared for the Kentucky Education Professional Standards Board under contract with the Appalachia Educational Laboratory. However, its conclusions and recommendations are those of the authors alone.

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THE PROFESSIONALIZATION OF TEACHING: CENTERPIECE OF KENTUCKY REFORM

Executive Summary

To achieve the goals set for the Education Professional Standards Board (the Board) by legislation related to the Kentucky Education Reform Act (KERA), the Board must adopt policies for teacher education and certification that reflect the particular principles of KERA and the implications of a growing body of knowledge about how educational systems can promote the academic success of all students. KERA mandates not only that graduates of Kentucky schools be able thinkers and effective users of the skills and knowledge they learn in school, but also that the schools take on new organizational structures, better adapted to facilitate student achievement. Both the valued student outcomes and the new arrangements necessitate significant changes in the way teachers function. These changes must be accommodated in professional preparation and continuing education programs, as well as in the requirements for certification.

The rapidly growing knowledge base for teaching is beginning to provide a firmer foundation for definitions of teacher competence and institutional effectiveness. While new research and related programs for improvement cover every aspect of the educational enterprise, from time and stress management to questioning strategies and thematic units, at the core of student success is student effort applied to worthy tasks related to sound goals. Effective teachers engage their students productively under the given school arrangements. One aspect of their ability is knowledge of the challenges students face at different stages of life. Educators are most effective when they can recognize children's developmental tasks and create conditions under which children can accomplish them successfully. For very young children, this may require helping them overcome problems that may impede later growth very seriously if not resolved. For middle school children, it requires both helping them manage developmental transitions and responding to their hunger for the competence they need to function more independently; their teachers must know something about the world and be able to teach it more fully than younger children demand. For high school students, it requires imparting knowledge of substance with more depth and complexity, illustrating the connections among disciplines, and continuing to promote responsible adult behavior.

Research on teaching has provided insights of increasing complexity about the nature of effectiveness. The process-product studies of the 1970s and 1980s helped identify skills that are an important part of a good teacher's repertoire--direct instruction, questioning strategies, and clarity about content and procedures, to name a few. More recent studies, some in the qualitative traditions, have revealed the intricate ways these skills are embedded in lessons.

Studies of student learning, curriculum, and the competencies required for productive participation in civic life are especially relevant to Kentucky's educational agenda. Together, these studies suggest that critical

thinking and effective application of "book-learning" to real-life problem-solving do not depend on the kind of rote learning that produces the higher standardized test scores used to show success in process-product studies. Rather, thought and application seem to depend on much more contextualized learning activities--for example, thematic units, interdisciplinary study, and cooperative learning--in which a teacher's knowledge of content, children, and technical skills play essential roles in making a lesson effective. These activities are better suited to developing the competencies measured by Kentucky's new performance assessments.

Careful observational studies (Percell, 1977) reveal that teachers' often unconscious biases about some children (for example, girls or members of minority groups) influence the way they use their skills and knowledge to facilitate student success. Research has also begun to reveal the characteristics of school organizations that facilitate teacher acquisition of new skills and approaches to instruction. The use of field experiences for both inservice and preservice teachers may do no more than confirm their traditional (and ineffective) habits unless attention is paid to the whole system that supports teacher behavior. A field experience can lead to transformation only if the context in which the new approach is to be practiced supports it. In short, to achieve KERA's ambitious goals, the knowledge base for teaching suggests that teachers need knowledge of human development and subject matter appropriate to the age of the children they will teach, a repertoire of technical skills, the ability to exercise good judgment about how and when to use different approaches to teaching, and the capacity to learn from their experience and adjust practice to assure the success of all the students entrusted to their keeping.

Most states use the certification process as an early exercise in quality control, often supported by a program approval process for preservice education that is intended to generate a supply of candidates ready to meet certification requirements. For the most part, the vast majority of candidates pass, and the process offers a low level of screening; the possession of neither a certificate nor a degree offers any real assurance of teacher quality. More than 30 states use a degree and a National Teachers Examination test score cut-off to screen applicants. Ten states have first-year induction programs and seven others have mandated assistance--non-programmatic--for first-year teachers. Two states--California and Minnesota--have committed to elaborate induction programs designed to exercise significant quality control and to promote acquisition of essential teaching skills during the initial post-baccalaureate teaching period. California has required inservice teachers whose classrooms have changed with major influxes of language-minority students to obtain new endorsements, and other states are in the early stages of requiring teachers with elementary certificates who accept preschool or kindergarten assignments to obtain early childhood endorsements.

The National Board for Professional Teaching Standards is conducting research and development to establish a set of standards and assessment activities that will enable experienced teachers to demonstrate superior professional skills. The Interstate New Teacher Assessment Support Consortium (of which Kentucky is a member), a body convened by the Council of Chief State

School Officers, is conducting research and development to establish a set of standards and assessment activities for initial licensure. Western Michigan University's Center for Research on Educational Accountability and Teacher Evaluation has been analyzing current evaluation systems and developing new assessment protocols for teachers at various professional levels and has proposed collaborating with educators in Kentucky. The Stanford University Teacher Assessment Project and the California New Teacher Project are both exploring options in configurations of assessment strategies, including portfolios, videotapes, teaching products and materials, and student products. The Education Testing Service is about to launch the PRAXIS assessment series, which begins with a preservice basic skills test and ends with a complex, comprehensive observational strategy. Research has not yet identified a complete set of perfectly valid and reliable strategies for assessing teacher competence, but very many promising practices have been identified. Useful strategies are now available that promote both teacher and student growth as a desirable side effect.

Policy Recommendations

Given the knowledge base, the direction of KERA, and its own sense of mission, the Board should do the following:

(1) develop a statewide framework of performance standards for teaching;

(2) establish a system of staged entry to teaching that includes assistance and assessment at each of the stages;

(3) undertake development or adoption of the complex assessments needed to implement a staged system of licensure;

(4) strengthen and integrate the internship into the new system of teaching standards;

(5) retain the present, three-tiered regular education framework for certification, but extend the lowest tier to include preschool (i.e., targeting ages 3 to 8 or 9); offer K-12 special education credentials only for serious disabilities (e.g., hearing, speech, or vision impairments, and multiple disabilities); and establish endorsements for areas within each tier and make special education for mild disabilities (e.g., learning disabilities) an endorsement area within each tier;

(6) establish a combination of recruitment strategies and procedures for exception to the general licensure regulations and monitor such exceptions closely;

(7) initiate a review of the National Council for Accreditation of Teacher Education (NCATE) unit and program accreditation standards

for their compatibility with the KERA vision (following this review, the Board should make a decision concerning which of the four available options for NCATE involvement the state wishes to establish);

(8) monitor the demographic characteristics of the teacher work force and develop policies that ensure the recruitment and preparation of a diverse supply of teachers; and

(9) seek adequate state support so that the Board may aggressively pursue its mission to develop a system of high-quality standards for the teaching profession.

INTRODUCTION

In 1990, the Kentucky legislature established the Education Professional Standards Board (referred to hereafter as the Board) as part of the systemic program of educational improvement launched with passage of the Kentucky Education Reform Act (KERA). Of the seven state-level autonomous standards boards in the United States, Kentucky's has the broadest mandate and the fewest substantive restrictions. To facilitate its discussions about how best to configure certification requirements and related professional development activities, the Board commissioned this report. In the first three sections, Leighton identifies, reviews, and analyzes the professional knowledge base regarding human development, the learning needs of children in each developmental stage, the role of field experiences in professional education, and certification trends in the states. These topics are particularly relevant to decisions now facing the Board. In the last section, Sykes suggests policy options supported by the knowledge base and describes some issues that his work indicates will inevitably arise as the Board implements new policies.

THE CONTEXT OF RENEWAL OF THE CERTIFICATION PROCESS

In describing the mandate that KERA set for the Kentucky Education Professional Standards Board, the Kentucky State Department of Education (KSDE) lists four goals:

(1) to assure that only appropriately qualified and certified individuals hold professional positions in public schools;

(2) to promote and maintain development of preparation and assessment programs that address the knowledge, skills, and ethical dimensions of teaching;

(3) to promote programs that sustain professional development and career advancement; and

(4) to determine and monitor standards and policies related to the profession.

To achieve these goals, the Board must adopt policies that reflect the principles embedded in the terms of KERA. In addition, the Board has the opportunity to build on recent, progressive programs adopted by the Kentucky education community and to take advantage of a rapidly growing body of knowledge about effective teaching and learning.

The KERA mission statement and 75 valued outcomes for students constitute evidence of the state's clear intention to provide education that develops knowledgeable and independent thinkers, learners, and doers. KERA and the valued outcomes define a distinctive domain for public education. In the words of former Kentucky Secretary of Education and the Humanities, Jack Foster, "If we are going to assume that all kids really are able to learn regardless of their circumstances...then we must find ways to create an

environment in which that can occur" (Appalachia Educational Laboratory, 1990). KERA mandates establishment of effective professional development and school-based decisionmaking, which affect the nature and structure of professional relations within schools and call for new professional skills. It calls for publicly supported early childhood education programs for all five year olds and for three and four year olds who have educational disadvantages or handicapping conditions that require early intervention to assure optimal development. This expands the need for early childhood educators with special training. KERA demands that schools serving large proportions of disadvantaged children be required to work with integrated social service delivery centers, which means that education professionals in those schools must know how to make the best use of those new programs. It requires that technology be used effectively in all aspects of public education, which means that educators must know how to integrate technology into their daily routines and adopt new routines made possible by use of technology. Under KERA, children in grades K-3 will attend ungraded classes, where they will master basic competencies before moving along to fourth grade, and this will require development of teaching skills and arrangements quite different from the traditional model.

Under these new arrangements, Kentucky children will be expected to learn how to apply basic communication and mathematics skills, as well as core concepts and principles from science, mathematics, social studies, arts, humanities, practical living skills, and vocational studies to real-world situations; demonstrate skills and knowledge essential for self-sufficiency and responsible group membership; think critically and creatively, conceptualize, and be proficient in making decisions and solving problems; and integrate and expand knowledge to meet the demands of new situations. These "valued outcomes" reflect the abiding and pervasive concern that all children emerge from the public education system with the capacity to participate fully in community life. While civic participation has been a goal of American education since the first colonial dame schools, nowhere has the language of recent state educational reform been plainer about the need to enable graduates to be thinkers and doers, rather than simply knowers, than in Kentucky.

This combination of changing the structure of the delivery system and recasting the state's educational goals reveals KERA's clear intention of reforming the entire system of public education, not just sprucing up one or another faulty component. Research (Fullan & Stiegelbauer, 1991) supports the validity of educators' common discovery in their efforts to improve schools: Piecemeal activities don't work. A teacher implementing cooperative learning for the first time gets negative feedback from peers or supervisors about the noise level. A principal keen to share decisionmaking bumps into complaints about teachers' role overload. A student teacher eager to try a whole-language strategy can't fit the lesson into the prescribed curriculum scope and sequence. The district experimenting with a new hands-on science program runs into problems with the achievement-oriented community. Even mutual goodwill cannot overcome the structural accommodation problems that may arise when a single part of such a complex system tries to change. On the other hand, while comprehensive reforms may be desirable, they can easily become unmanageable. In mid-flight, repairing a propeller may be problematic, but

rebuilding the whole airplane is downright daunting. As the investigations leading to the KERA's enactment demonstrated, however, patching up one leak would not do the job; nothing short of systemic reform could meet the needs of Kentucky's children. Kentucky is not unique in this regard--indeed, several other states forced by circumstances to evaluate their education systems have come to similar conclusions--but Kentucky has become the leader in facing its problem squarely and developing a collaborative vision to shape its multidimensional reform work. The mission of the Board is to exercise leadership in bringing to life one element of this shared vision: to develop and enforce standards based on what teachers should know and be able to do in order to function effectively under the new, KERA-inspired arrangements.

Recent Kentucky decisions (some pre-KERA) about teacher licensure and preparation show the education community's interest in building a progressive, grounded, self-renewing system that reflects the wisdom of research and practice. On the basis of feedback that candidates want and need school-based activities to anchor their coursework, four-year college basic preparation programs now include at least 150 clock hours of field experiences--most programs provide more than the minimum hours. On the basis of recommendations from professional associations and researchers, current requirements for early elementary and middle school certification show a concern for meeting children's normal developmental needs and accommodating special education students in regular settings whenever possible. The structure of the middle school requirements indicates the importance of balancing subject matter expertise with attention to the whole child, in line with proponents of the middle school philosophy. The collaborative first-year internship has set an important precedent, forging productive relationships among KSDE, higher education, and local districts, and developing powerful strategies to help beginning teachers use research-supported skills in the classrooms of Kentucky.

The responsibility of the Board is to make sure that Kentucky's schools are staffed only by teachers who know how to promote students' achievement of the valued outcomes and who can participate in the learning communities to be developed under KERA's terms. A growing body of evidence can guide future policy decisions about teacher certification. As the sections that follow will show, the professional knowledge base is sufficiently developed to support confidence in choosing from one array of policy alternatives and to show the weaknesses of others, in light of the goals of KERA. However, the provisions of KERA and the high priority of identifying and adopting more effective educational structures and strategies implicit in other prized activities of the Kentucky education community (for example, the internship program) must ultimately guide selection of particular policies from the set of defensible policy alternatives for certification. It is essential that the Board cast its own vision brightly, collaborating with colleagues to frame standards that make sense with respect to the particular demands of KERA, as well as the evidence of research and practice.

As defensible standards are framed and adopted, the Board must follow up with activities that promote experimentation among the institutions that prepare teachers and nurture their professional development, to identify practices that facilitate acquisition of the professional skills and knowledge

related to the standards. While the mission of the Board has been set within the ambitious overall goals of KERA, the programs to achieve the mission are still being developed in many sectors of the education community. Educators with imagination and experience can see that the instructional and management strategies that enabled a teacher to be successful with 25 six year olds organized into three homogeneous reading groups are not the same as those needed for success in a class full of five to eight year olds on different trajectories and in different developmental stages. The skills and knowledge that make a successful junior high lecturer, preparing young adolescents for a multiple-choice test, are not the same as those of a successful middle school teacher, teaming with a colleague on an interdisciplinary lesson using cooperative learning groups and aiming for student success on a portfolio exercise. Adding a handicapped child or two to a regular education class may create a richer learning environment for all--but only if circumstances and strategies make it workable. No state has found the proverbial silver bullet of staff development: a program that remodels teachers over a week-long workshop or a summer. No university has the three-credit course, the integrated field experience, or the workshop series that effects a transformation. No teacher education program has found the recipe for changing the candidates' 12-year apprenticeship of observation as students into a stepping stone to new forms of teaching--instead of what it has always been: an unchallenged force that preserves some traditional practices despite evidence of their ineffectiveness. However, educators at every level are working on solutions to the challenges of training and retraining. Furthermore, agencies such as the National Science Foundation and the Annie E. Casey Foundation are funding experiments all over the country to identify solutions. In this climate of exploration and creativity, the Board has a chance to set standards for teacher competence that are tied directly to the KERA vision and to help every current and prospective teacher achieve a high level of competence. Through its certification policies, the Board can promote programs to implement those policies effectively and place competent teachers at the heart of the reform movement.

THE KNOWLEDGE BASE FOR TEACHING

Two Constants: Student Effort and Learning Task Quality

Two aspects of teaching and learning remain constant across settings, and the Kentucky standards should reflect attention to both. First, the primary mediator of learning is student effort (Tomlinson, 1980). One goal of setting certification standards must be to establish that candidates have the requisite knowledge and skills to engage students actively in learning under the new conditions of Kentucky's preschools, ungraded primaries, middle schools, and high schools. Research and reflective experience have both revealed the folly of some time-honored practices; in particular, they have taught that a teacher's continuously dispensing knowledge does not equate with a student's continuously receiving it. In the final analysis, students of all kinds learn more when they work harder at learning. To assure the kind of student learning that is KERA's goal, teacher expertise must be defined to

include mastery of a repertoire of strategies adequate to elicit effort from the students under the planned workplace conditions. The developmentally appropriate, mixed-grade, interdisciplinary arrangements promoted by KERA require a teaching repertoire different in substance and extent from the traditional structure that was declared unconstitutional because, as Secretary Foster commented, it failed so many students (AEL, 1990). As strategies of well-documented effectiveness in many learning arrangements, the direct instruction (Rosenshine, 1987) or mastery teaching models (Hunter, 1987) will continue to be important parts of the good teacher's repertoire, but many other dimensions of teaching will assume new prominence. Kentucky's goals are achievable only if teachers know how to get children to work hard under the new learning arrangements--and that will require more than one approach to lessons.

Second, the kind of work in which students engage also influences achievement directly and strongly through both its nature and its content. Doyle (1983) explains that the task structure itself influences student learning, because the structure determines which mental operations students practice. Furthermore, teachers with limited background in a subject are likely either to circumscribe lessons carefully to include only those areas they have mastered or to present skills without the conceptual underpinnings that students need for generalizing to other applications (A. Reynolds, 1992; Grossman, Wilson, & Shulman, 1990; Lichtenstein, McLaughlin, & Knudson, 1991; Wineberg, 1987). For students to achieve the valued outcomes of KERA, they must have teachers who are able to provide fully developed representations of content and to discern what "content" means at different developmental stages. In short, the essence of effective teaching will continue to be the capacity to engage children in hard work on tasks that are worth their serious effort.

Human Development

Increasing knowledge of human developmental patterns has generated a rationale for one type of differentiation among teacher preparation programs. This brief summary sketches a few of the broad dimensions of change that teachers must take into account with different age groups.

People ordinarily move through a predictable sequence of developmental stages, each characterized by different learning needs and predispositions.* Although individuals vary in the pace of development, the sequence of events in each dimension of growth is fairly generalized, as is the interplay of

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*This short review of some of the major events in human development draws on a body of research most easily accessible through textbooks designed for teachers. It is taken from Bee's text, The Developing Child (1985), which focuses on research that illuminates aspects of development of particular relevance to education.

events across dimensions. Three year olds typically have the skills and knowledge to ride trikes, use scissors and pencils, speak with some grammatical accuracy, and play cooperatively, usually with peers of the same sex. They are beginning to be able to pretend and to show concern for others. By five, children have the physical skills to hop and skip, the cognitive skills to classify objects, and the language skills to use tenses and plurals regularly in communicating. They know who they are (and that they haven't been and won't turn into someone else), and they are beginning to be able to put themselves "in another's shoes." Their best friends are those that live nearest. By seven or eight, children have the motor skills to ride bikes and the cognitive skills to rehearse until they remember things, to trade roles with another, and to see the personal benefits of good behavior. Not until after eight do children typically define themselves with both inner and outer traits and begin to have friendships that survive minor dislocations. They begin to reason inductively--to figure out what the rules must be, given a series of events. From 10 to 12, just when they have mastered the management of their childish physiques, they begin the transformation into physical adulthood. Hormones become a force to be reckoned with. In the cognitive domain, they can identify several strategies for solving problems and see the rationale for social rules that are sometimes personally inconvenient but on the whole generate order. By 12, girls are in their last growth spurt and well into puberty, awkwardly towering over boys, whose growth peaks at 14 or 15. Children's self-definitions acquire more psychological detail, their thinking evolves toward formal operations, and their social life centers on peer interactions, hopefully with an "in crowd." Most children achieve physical maturity and sufficient social and cognitive skills to manage with fair autonomy by the end of high school. Table 1 gives a more detailed summary of child development (Bee, 1985).

Features of the culture of a child's immediate community may generate traits easily mistaken for problems of development if they are not understood in their cultural context. For instance, some American dialects have patterns that speakers of the "standard" dialect may perceive as deficient, because of different use of inflections or tenses. Studies of a dialect sometimes called "Black English" (although it is not spoken by all African-Americans) taught sociolinguists much about perceptions and realities of relationships between speech and cognition. Using the tools of analysis that reveal a dialect's complexity, researchers demonstrated that it was fully as capable as Standard English of communicating nuances of meaning; it was an alternative speech pattern, not an immature one, as some teachers thought (Dale, 1976, cited in Bee, 1985).

Social practices that are essentially cultural in nature--for example, the extent to which children are permitted or encouraged to participate in conversations with adults or to which they perceive questions as real and not rhetorical--may create classroom behavior patterns that appear to indicate developmental delays. However, closer examination of children's abilities within culture-fair frameworks typically reveals no functional deficit (Villegas, 1991; Cazden & Nehan, 1990). For instance, Cazden and Nehan report one study in which 10-year-old boys from middle-class and very low-income families were asked to describe animals shown to them in pictures. Boys from both high- and low-income families were able to list about one-quarter of the

Table 1

Selected Developmental Events That Affect Teaching and Learning
(Adapted from Bee, 1985)

Dimension	Age: 2-3	4-5	6-7	8-9	10-11	12-13
Physical	Runs, toilet trained, uses scissors, stacks blocks	Takes stairs easily, kicks, tosses ball, hops, skips	Jumps rope, skips, draws figures, rides 2-wheeler	Rides bike well; early onset of puberty	Early puberty for boys and girls	Girls' growth spurt; increase in muscle, fat; average onset of puberty
Cognitive	Classifies by function; short sentences; minimal grammar	Classifies by size, shape, color; uses past tense, plurals; deficiency in memory tasks	Conservation of mass and number; uses rehearsal and other memory tricks	Inductive logic; conservation of weight	Multiple problem-solving strategies; conservation of space	Beginning formal operations; systematic analysis
Social/ Cognition		Some physical perspective-taking	Subjective perspective-taking; moral sense based on punishment	Reciprocal perspective-taking; moral sense based on reciprocity	Mutual perspective-taking; some conventional morality	Societal perspective-taking
Personality	Self-definition based on size, age, sometimes gender	Gender stability; self-definition by physical properties or skills	Strong sex-role stereotyping and imitation of same-sex models	Self-definition includes inner and complex traits	Self-definition adds inner and complex traits	Self-definition more by personality and beliefs
Relationship	Parallel play with peers; pretend play with objects	Best friends are those nearest; socio-dramatic play	Same-sex play groups	Enduring friendships appear	Enduring friendships continue	Cliques arise; friendships deepen

observable attributes after several prompts; however, those from low-income families needed almost twice as many prompts to achieve the same level of recollection. Tests of similar nature are often used to assess academic achievement, and a socially learned habit of silence may well generate a score suggesting lower ability than a student possesses. Persell (1977) reviewed research on the behavior patterns associated with teacher expectations and showed how the culture of the classroom may depress the engagement and achievement of girls and minority students. Unexamined beliefs that some children are less capable than others--beliefs often predicated on the way children talk or dress--may lead teachers to what they see as a kindly effort to let some students off the hook academically. They reward those students lavishly for less work or less thoughtful answers, call on them less often, and challenge them less often. In the interest of protecting the students from failure and expediting recitation sessions, the teachers create a cultural milieu that discourages achievement among students whose personal cultural attributes are mistakenly interpreted as signs of low ability.

Differences in family circumstances also lead to differences in development that appear to be cultural in origin but are, instead, socioeconomic. Bilingual educators in Texas border towns described the developmental delays of Mexican children whose family situations were so desperate and disorganized that children were seldom spoken with and were consequently unable to communicate adequately even in their native language. Specialists saw these as poverty-induced delays. Similar delays were observed in Southeast Asian refugee children arriving from jungle camps where they had been interned for years. In both cases the problems were both physical and cognitive, and they were caused by poor health and nutrition rather than by cultural conditions. To the extent that any group is disproportionately represented in the lowest socioeconomic levels, its distinctive cultural attributes--such as dialect or conversation patterns--may be associated with real developmental deficiencies that stem from economic conditions which are not themselves cultural.

Handicapping conditions may affect overall development. About one-fifth of American children up to 18 years of age are developmentally atypical, and another 10 percent have significant reading problems (Bee, 1985). Less than 5 percent have disabilities that in themselves interfere with development. Of these, the most thoroughly studied group is that of children with IQs of less than 70. These children seem to have slower reaction times, a greater need for practice to learn new skills, and a general inability to transfer learning from one situation to another. Deaf children may suffer language delays if their condition is not diagnosed early and treated promptly. Children with severe physical handicaps may experience developmental delays arising from limitations of experience that promote cognitive and social development in others. A small percentage of developmentally atypical children grow in stages different from typical children.

Studies of human development often compare people of quite diverse backgrounds to determine the extent to which the nature or sequence of development in any dimension might vary with culture or location. Although the details do reflect the influence of the immediate environment, for the most part people follow similar paths to maturity.

Developmentally Appropriate Teaching

Teachers must know how to use methods and material appropriate to learners in particular developmental stages. What is necessary and productive for four year olds may not be suitable for ten year olds. The solution to the language problems of a preschooler who has not engaged in much conversation in any language or dialect is different from the solution for a child who is fluent in another. The proper coaching strategy for a 15-year-old learner of normal intelligence may not be the proper strategy for one with limited mental ability.

Early Childhood Education

The goals of early childhood education (usually defined as programmatic learning activities for children of eight and under) address social, emotional, cognitive, and physical development in particular ways. Preschoolers must establish a sense of self-esteem, a positive attitude about life, and the ability to get along with peers and others in order to participate productively in collective experiences. They need to strengthen and extend learning and problem-solving skills, reason more logically, improve their understanding of the immediate environment, extend perspective-taking by engaging in make-believe play, improve communication skills, and build the foundation for later development of reading and writing skills. In the physical domain, they need to enhance and refine their gross and fine motor skills and use all of their senses to learn (Dodge & Colker, 1992).

To facilitate children's attainment of these important early objectives, teachers need to know and do certain things. A 1991 review of research, conducted by the Association of Teacher Educators (ATE) and the National Association for the Education of Young People (NAEYP), suggests that effective early childhood educators are

- educated in the liberal arts and knowledgeable about a variety of disciplines in order to recognize the learning embedded in children's activity;
- well informed about developmental theories and their implications for practice;
- knowledgeable about the significance of play to children's educational development and [able to facilitate] enriching play in early childhood classrooms;
- cognizant that families provide the primary context for children's learning and development, respectful of the diversity in family structure and values, and skilled in interacting with parents in ways that enhance children's educational success; and
- able to supervise other adults, coordinate teaching activities with theirs...and reflect on...professional development. (p. 18)

The research on the relationship between teacher preparation and young students' growth indicates that "early childhood teachers with a strong background in early childhood development and education interact with children in ways that are more growth promoting" (ATE & NAEYC, 1991, p. 18). Educators' background should include, first, knowledge of physical, cognitive, language, and socio-emotional development; the contribution of play to development; the role of environment in development; and strategies for assessing development and prescribing special treatments. Second, early childhood educators should be able to help parents support their children's development and identify other services to help them with children's special problems. Studies show that parent involvement in early childhood education produces significant long- and short-term effects (Cochran & Henderson, 1985; Dickie & Gerber, 1980). Third, effective early childhood educators should be able to arrange environments and activities that promote children's growth. In particular, teachers should know how to build on children's interests and concerns and how to integrate learning experiences into relatively informal situations. When teachers listen to young children and ask them questions, the children grow in social skills and ability to finish work (Phillips & Howes, 1987). When children experience opportunities to choose activities and learn to work independently, their cognitive skills and cooperativeness improve (Clarke-Stewart, 1987). Fourth, because young children are especially dependent on caretakers for their health and safety, early childhood educators should be well schooled in matters of health, nutrition, and the maintenance of a safe environment. Fifth, early childhood educators should have experience applying principles and concepts in real classrooms and reflecting on their experiences with the guidance of supervisors. Teachers who control, direct, and punish--the most tempting response of beginning teachers to classroom problems--have a negative impact on their young students' achievement (Clarke-Stewart, 1987). Kagan (1990) reports that in one survey (Hatch & Freeman, 1988) more than two-thirds of the kindergarten teachers who responded revealed that what they did everyday in class violated their own beliefs about children's needs, but they knew of no alternative. Finally, like other educators, early childhood specialists need a core of professional knowledge and skills to shape their future development efforts and enable them to participate productively in a community of professional learners (ATE & NAEYC, 1991).

In short, because the rate of development in the preschool and primary years is so fast and because subsequent development is influenced by foundations built during these years, early childhood educators must focus on the body of knowledge and skills that enables them to promote development and to identify and remediate quickly any problems that appear. While they may not teach advanced content, they must understand the nature of the concepts in several areas of learning in order to build solid foundations for later learning. Research on several different kinds of obstacles to school success indicates that appropriate early intervention is the most efficient, effective, and economical way to assure later success in school and in life (Lazar & Darlington, 1982; Ramsey & Haskins, 1981). Furthermore, failure to ameliorate problems identifiable in early childhood leads to very costly consequences in later grades (Slavin & Madden, 1987).

The Upper Grades: 4-12

Researchers have gathered some evidence of a need for early childhood teachers to know how to cope specifically with language delays or coordination problems, because those are significant roadblocks to important goals. This generates the need for careful preparation in developmental issues for early childhood educators. Once children are launched--able to make their own peanut butter sandwiches, get themselves to the bathroom, and make some sense of print and numbers--educators' preoccupation with the fine points of development diminishes somewhat and gives way progressively in the upper grades to a preoccupation with methods and subject matter. Thus, the research and knowledge base on which preparation programs for teachers of upper grades are predicated have a different nature.

Developing definitions of effectiveness. During the 1970s and 1980s, educators made a concerted effort to document the kinds of teaching that generated the best learning outcomes for the most students. In their efforts to systematize and make more "scientific" the basis of claims about teaching, they focused on discreet behaviors and the correlations with scores on standardized tests of basic skills. Their best known work is "process-product research," in which they identified the common, countable attributes of teaching observed in classes with exceptional achievement on standardized tests; in many cases, they experimented to enlarge understanding of the exact nature of the effective strategy and discover the extent of its effects. Much of the research was naturalistic, in the sense that it began with observations of practice known to be effective by its outstanding results and analyzed the observation records to determine which behaviors were most often associated with good results on tests. Once teaching skills were identified, investigators set up experiments in which some teachers used them and some did not, or teachers used them with some children and not with others in a control group, in order to test hypotheses about their effects. On one hand, these were the most orderly and clear studies available up to that time, and they were most illuminating; on the other hand, their order and clarity stemmed from simplifications of both teacher inputs and student outcomes that did not reflect the complexities that most people associate with real education. Subsequent investigations and practice have provided a richer understanding of the context in which these targeted skills work. While researchers have continued efforts to identify other skills and aspects of teaching and learning that can be managed for greater productivity, the education community embraced the recommendations coming out of process-product studies and incorporated them into expectations for competent teaching.

Some of the most compelling evidence from this period led to widespread promotion of the model called direct instruction or explicit teaching. An analysis of many studies led Rosenshine (1987) to suggest that...when effective teachers teach well-defined concepts and skills, they:

- o begin a lesson with a short statement of goals...[and] a short review of previous, prerequisite learning;

- o present new material in small steps, with student practice after each step;

- o give clear and detailed instructions and explanations;
- o provide a high level of active practice for all students;
- o ask many questions, check for student understanding, and obtain responses from all students;
- o guide students during initial practice;
- o provide systematic feedback and corrections;
- o provide explicit instruction and practice for seatwork exercises and, when necessary, monitor students during seatwork;
- o continue practice until students are independent and confident (p.76).

Hunter (1987) popularized a version of the direction instruction model called "mastery teaching." Although her own views--often stated--are that each lesson element provides an opportunity for teacher analysis and decisionmaking about what to do next and that teaching is not simply a matter of following a script, her work has formed the foundation of several teacher observation and evaluation systems that characterize predictable applications of Hunter's lesson elements as the necessary (and often sufficient) components of every good lesson. In their respective ways, Hunter and Rosenshine synthesized the process-product research and organized its findings so that it became much easier for teachers and supervisors to talk to each other about pedagogy and to enter into the spirit of accountability by adopting a more rational framework for performance evaluation than most had experienced previously. Where student achievement is to be measured primarily by standardized tests in the multiple-choice format, the evidence suggests that direct instruction can be a useful strategy.

Brophy (1987), who conducted research in the process-product tradition, found in his work and that of his colleagues the grounds for several recommendations about strategies for motivating students to learn. First, teachers must establish the preconditions for learning, including a supportive environment and meaningful, appropriate learning activities. Second, they must maintain expectations that all students can and will succeed, by teaching goal setting and self-monitoring, showing the connection between effort and achievement, and coaching in the social skills that support school success. Third, teachers must supply extrinsic incentives that reward growth, structure competition fairly, and show how academic success contributes to other valued outcomes. Fourth, teachers must develop strategies to capitalize on student interests and abilities. Fifth, teachers must stimulate students' own motivation to learn by modeling, offering enthusiastic support, playing devil's advocate, and expressing confidence in them.

Following the implications of these lines of careful study, teacher education textbooks began to emphasize development of observable, quantifiable skills. For example, Classroom Teaching Skills (Cooper, 1990), selling almost

10,000 copies per year, includes chapters on lesson planning; developing objectives; presenting a lesson that has set induction, explanations, and closure; asking questions at all six levels of Bloom's taxonomy; teaching concepts; using effective communication skills, such as active listening; creating orderly classroom environments and developing routines; using cooperative learning strategies; and evaluating student performance.

Investigations of elementary and secondary teaching expertise by Berliner (in press) and others have identified the ways highly respected teachers weave together elements of professional performance to create tapestries whose intricate designs contribute to a pattern of deceptive simplicity. For example, in one study (Leinhardt & Greeno, 1986) the expert completed a mathematics lesson review in less time than the novice, accomplishing substantially more: taking roll, assessing prerequisite knowledge, and determining who had completed the homework. In another study (Krabbe & Tullgren, 1989, cited in Berliner, in press), the experts took substantially longer than novices to introduce a literature lesson, because they integrated references to students' prior experience in and out of school and involved students more spontaneously and often. Experts use features of the classroom, the particular demands of a task, and the social context to adjust instruction continuously during the lesson (Housner & Griffey, 1985, cited in Berliner, in press). Borko and Livingston (1989) characterize expert teachers as "improvisational performers," who adapt their teaching in response to students' verbal and nonverbal feedback. The clear implication of these results is that teachers identified by colleagues as "experts" because they so regularly stimulate students to unexpectedly high levels of academic success do not follow simple guides to "effective teaching" based exclusively on current findings of process-product research. To be sure, their evident skills include the elements of mastery teaching, balanced questioning, and appropriate use of wait-time; however, these skills are part of a much more extensive repertoire. Although expertise develops during professional experience, the extended repertoire has its roots in preservice and induction programs, where novices both practice discreet skills and learn how to use them insightfully in real classrooms (Far West Laboratory, 1992).

Influences of context on the effectiveness of teaching strategies. Ongoing research and increasing practical experience with these strategies have confirmed their value and begun to show their limitations, as is always the case in developing knowledge bases. For example, the research on questioning initially showed that most classroom questions test only recall. This led educators to wonder how that might influence students' ability to answer questions requiring deeper thought. Further studies showed that varying the level and difficulty of questions according to the nature of the instructional objective and the students is essential for effectiveness. Asking many recall questions helps students learn the facts they may need to answer higher level questions; asking thought-provoking, open-ended questions promotes critical thinking, evaluation, and extension of learning. Asking easy questions (that is, ones most students know the answers to) may be an effective way to warm up a class session, but it is not a good way to assess mastery. Very adept students may find a hard, higher order question just the right kind for the end of class, because it gives them something to mull over until the next session, but students who are struggling to understand content

may find the same question discouraging. Context counts. One group of studies (Rowe, 1986) revealed that teachers seldom wait long enough after asking a question for students to come up with thoughtful answers. Only the brightest, most outgoing students have a real chance to answer. On the other hand, by waiting too long (in hopes of thoughtful answers), teachers may slow the lesson to a pace that leaves everyone bored. The current understanding of the pedagogical implications of the research on questioning is that teachers must recognize that the influence of questioning strategies on pace is a variable to be used to make lessons effective.

Among the influences on the relevance and effectiveness of a given strategy is the structure of the teaching context. In a situation where a student needs to know something best learned in a teacher-directed lesson, the guidelines for direct instruction or mastery teaching are extremely helpful in making that experience efficient for both the teacher and the student. This improved efficiency is the basis of a "modified Joplin plan" in which for brief periods of the day, for reading and mathematics lessons, students are placed in cross-age, cross-grade groups with those whose achievement level is the same. The teacher offers a directed lesson on the more-or-less justified assumption that the whole group is ready for that lesson; during that time, all students are receiving the direct attention of a teacher addressing their particular learning needs, and none are occupied with possibly unproductive seatwork, waiting for their turn to learn (Slavin, 1987a, b, c). While this homogeneous grouping seems productive for limited times under carefully controlled conditions, it is decidedly unproductive as a global strategy. Indeed, it contributes to increasing inequities among students at various ability levels when it is the main grouping mechanism over a day, a program, or a year (Slavin, 1990a). However, as student needs and interests shift throughout the day and lesson content changes, good teaching may involve some or all of the mastery-learning components.

Research on peer tutoring, reciprocal teaching, and cooperative learning (Palinscar, 1984; Slavin, 1990b; Cohen, 1986) supports the growing trend toward mixed-ability, mixed-age grouping, as is found in ungraded primary classes, middle schools, and some high schools. Properly used, these strategies promote individual achievement and social skill development and foster the creation of learning communities in classrooms. Carefully controlled studies show that low, middle, and high achievers of all types (sex, race, ethnicity) improve achievement when participating in activities structured to reward group effort, measure individual achievement, and enable each member of the group to contribute equitably (Slavin, 1985, 1987a, b, c). In some settings, there is less demand for whole-class, teacher-directed lessons and more demand for student-centered, multilevel, multidimensional activities that often address goals in several subject areas simultaneously. The application of techniques shown to facilitate student effort and sharpen learning under these conditions is different from methods used in a direct instruction lesson.

In short, the good news about process-product research is that educators have evidence that many learnable techniques have predictable and desirable effects in the classroom; the bad news is that use of these techniques cannot follow simple prescriptions (Brophy & Good, 1986). In fact, evaluation

systems based on teachers' adherence to a well-defined direct-instruction model may cause what Darling-Hammond calls a "dual accountability dilemma" (Sclan & Darling-Hammond, 1991, p. 9). To accumulate the right kinds and number of tallies on the "effective teaching checklist," a teacher may have to ignore student responses that indicate the need for a midlesson shift to a new format; one may not be able to be accountable to the evaluation system and the students in the same lesson. Good teaching involves appropriate use of a repertoire of strategies that includes those identified in process-product research and now included on evaluation and coaching instruments, as well as a host of other creditable practices used by expert teachers and now being investigated with equal thoroughness.

Pedagogy in middle and high schools. The change from a junior high/senior high to a middle school/high school grade configuration signals a shift from a focus on subject matter to a focus on developmental issues as well as subject matter. Helping students learn to cope with the personal and academic transitions characteristic of early adolescence is one of the ways communities hope to support their educational and social success. Educators involved in the middle school movement often try to address students' social and emotional goals by creating small learning communities within larger schools, so that students spend most of their day with the same 100 to 150 peers and four to six teachers. In these communities, teachers learn to work in two new professional dimensions. First, they are expected to generate collective responses to students' developmental needs--to know about the nature and implications of the physical, social, and emotional changes of early adolescence and to collaborate on helping each student meet the challenge of those changes. Second, they are expected to create connections between their courses, either by team teaching or by making individual references. For instance, the fine arts teachers may join the history teacher for a two-period-long humanities course; or they may coordinate their separate classes to reinforce learning across curricular areas; or they may simply mention each other's classes at appropriate moments in their own classes. In any case, middle school teachers must learn enough about subjects other than the ones they teach to help their students make sense of the whole curriculum. While there is not yet sufficiently extensive research to show how much knowledge and skill in both early adolescent development and subject matter is necessary to be an effective middle school teacher, the structure of the institution is built on the assumption that teachers will know and be able to act on a more extensive knowledge base than was the case in either K-8 or junior high scenarios.

Recent research on the effectiveness of high schools indicates that some of the arrangements made to expand and systematize educational programs have led to serious problems for students. Three aspects of high school life under increasing criticism are tracking, isolation of one subject from another, and school size. Slavin (1990a) and Oakes (1986) are among the researchers who have reviewed studies investigating the effect of ability-based tracking systems on student achievement. They conclude that the apparent efficiency hoped to be gained by separating high from low achievers and vocational from college-bound students, and providing classes tailored to their respective abilities and plans was seldom, if ever, realized. The high achievers and college students do reasonably well, but not reliably better than they do in

mixed groups. The low achievers and vocational or general track students do significantly worse, for several reasons (Oakes, 1986). First, because the content of courses is more limited and they do not have opportunities to take more advanced courses, low-track students do not have access to as much learning as high-track students do. Second, in high-track classes, teachers spend more time on academic work and students are expected to spend more time on it--and they do; neither the opportunity nor the expectation characterize low-track classes. Third, in high-track classes teachers were friendlier, more positive, more encouraging of critical thought; in low-track classes, teachers spent more time getting control, punishing misbehavers, and encouraging compliance with procedural rules.

Sizer (1984) determined from his research that fragmentation of their learning experience provides most students with far less knowledge and skill than the time spent in high school should warrant. He recommends simplifying the curriculum and offering courses that examine related fields, such as literature and history or science and math, together. In "essential schools," which use Sizer's ideas to develop their own new approaches, students take a few courses taught by teams of teachers from different content areas, study fewer topics more deeply, and generate exhibitions that demonstrate their ability to find, organize, and present information about a given subject. Eleven Jefferson County (Kentucky) schools have recently adopted this model, along with hundreds of other schools across the country that form the Coalition of Essential Schools. Neufeld (B. Neufeld, personal communication, July 7, 1992) has conducted studies of the essential schools--including Kentucky's--as part of the Citibank Faculty Program that trains teachers during intensive summer workshops and enables them to offer peer coaching to colleagues in their home districts who are trying to implement Coalition principles. She has found that even the most talented and enthusiastic teachers encounter significant obstacles to change when they try new methods. The approach to teaching and learning is so different from their previous experience that formerly useful insights and mental images provide very little illumination on practice. Teachers' history of being held accountable for covering a mass of content makes them worry about lingering to mine a rich vein of student interest--even though they know that coverage has never been equivalent to achievement. The older students at first perceive new methods as wrong and unlikely to lead to academic success, and the supervisors can find nowhere on their standard evaluation sheets--or even in their unwritten frames of reference--to record the high and low point of the lesson. Teachers may find little support from sources who have traditionally been very affirming. Although the essential school model is rich in possibilities for attaining KERA goals for students as well as teachers, research suggests that systemic change will be needed to implement it effectively.

The large size of high schools is seen by many as an obstacle to students' success, and many schools, including those developing versions of the Sizer model, are experimenting with structures that create learning communities within comprehensive high schools. In Philadelphia, for instance, Fine and her colleagues (M. Fine, personal communication, March 3, 1992) have helped inner-city high school faculties form "charters" that include up to 400 students and a prorated number of teachers who share an interest in a general topic around which all studies are organized. Students and teachers remain

accountable to the district's goals, but their lessons focus on their special interest: for example, business or environmental studies. Although this reform effort is too new to have documented stable outcomes, early results show improvements in student and teacher attendance, student achievement, and teacher morale. Chicago public high schools have launched a version of this model that includes vocational education and that integrates diverse subjects--such as literature and auto shop--in the same courses to help students learn how various areas of learning can inform each other. Charter schools and learning communities within essential schools give substance to faculty efforts to participate in school-based management decisions. In Jefferson County (Kentucky), the content of shared decisionmaking at Fairdale High School and The Brown School often centers on projects related to careful application of the essential school model to their own complex work.

The research on the effectiveness of new arrangements in the upper grades is not yet as conclusive as the process-product studies have been, but general dissatisfaction with the problematic outcomes generated by traditional approaches motivates continued experimentation. Teachers who work in these new structures clearly need specific skills and knowledge to make good use of these opportunities for promoting student achievement.

Special Education

Recent reviews of research on the preparation of special educators (McLaughlin & Stettner-Eaton, 1988; M. Reynolds, 1990) indicate that the vast majority (75 to 90 percent) of children identified as needing special education services have mild handicaps. Assisting them involves more intense application of the strategies used in regular education: that is, they may need more practice or quieter working conditions or more positive reinforcement, but they do not usually need strategies unfamiliar to regular teachers. In general, the literature does not report much evidence that intensive special training and certification for teachers of children with mild disabilities leads to greater effectiveness. Instead, it suggests that such children benefit from greater intensity of treatment, provided by either the regular teacher (freed from other responsibilities for the time) or a specialist who works in the regular classroom. Responding to children with special needs of any kind does take time and attention that are not available without extra classroom support; however, most teachers have the skills and knowledge to cope with mild disabilities, if they have the time to do so. Whatever the delivery mode, teachers working with mildly handicapped students--that is, most teachers--should know the legal and ethical principles related to special education, the ways to modify curriculum to make it more accessible, a variety of instructional theories and methods, appropriate assessment strategies, and how to use technology to support instruction.

About 5 percent of the population under the age of 18 have handicaps that require highly specialized treatment. Teachers of these children must learn, for example, how to communicate in sign language, teach reading in Braille, or manage life-support systems. If they are to be mainstreamed (and many should be), regular teachers must know how to collaborate effectively with the specialists who work directly with the children. The rationale for

special preparation related to the developmental needs of children of different ages applies to this group as well as it applies to others. Very young children with disabilities have different developmental agendas than older children, and knowing how to assess and accommodate the differences improves a teacher's effectiveness. However, the incidence of most severely handicapping conditions is so low that most preparation programs target the full K-12 range within their special area, because few districts hire this kind of specialist for a narrow grade range. The exception is early childhood special education, where the content of the preparation program is focused on developmental issues of young children and the particular interface between disability and development.

Multicultural Classrooms

Streams of immigrants have been changing the composition of student bodies since colonial times, but growing awareness of the need for equity combined with improved understanding about how to achieve it have recently generated a proliferation of programs to equip teachers with better skills in coping with multicultural classrooms. Studies conducted by the National Center for Research on Teacher Learning (NCRTL, 1992) looked at preservice and inservice programs of many kinds to determine which had an observable impact on teacher understanding of the cultures of their students. Virtually none did. While many enabled teachers to describe the features of target cultures, few helped them develop strategies for determining whether these features were relevant to teaching or learning in their own classrooms. In fact, in some cases the information intensified hidden prejudices and their effects. For instance, operating on the debatable assumption that African-American students have characteristic learning styles, teachers might lower expectations (and attendant helping behaviors) for such students on tasks requiring an alternate approach; or assuming the greater diligence of Asian students, teachers might fail to appreciate a relatively low-quality work product that resulted from a student's best effort. Preliminary analysis of patterns of program failure suggests that

> ...it might be more fruitful to help [teachers] learn to think strategically about learners--about their differences and...the interaction of these learners with subject matter and the particular school and community context, and about ways to engage them with important substantive ideas (NCRTL, 1992, p. 4).

Although it is no doubt as enriching for teachers as it is for students to engage in ongoing study of the variety of cultural experiences in the mosaic of American life, there is little evidence that awareness of the facts of diversity improves teaching effectiveness. Rather, such evidence as there is suggests that teachers might benefit from instead learning about the nature of culture and its influence on behavior and developing ability to recognize when cultural differences might be the source of classroom behavior that might otherwise seem inappropriate (Cazden & Nehan, 1990).

Research does show that cultural and other nonacademic variables among students influence teacher expectations and teacher behaviors. Dialect,

dress, cleanliness, manners, and gender have deep and pervasive impacts on teachers' perceptions of student ability and treatment of students (Percell, 1977). Popular staff development programs such as "TESA: Teacher Expectations and Student Achievement" help sensitize teachers to their own unconscious habits of interaction and the consequences for their students' achievement. While teachers in newly multicultural schools across the country say they are eager for information about children whose backgrounds differ from their own, the NCRTL review (1992) suggests that existing programs do not help teachers identify where poor cultural interface may be blocking communications with students or how they can resolve such problems. Professional education in the multicultural arena must influence both understanding and performance in the classroom if boys and girls of every American subgroup are to have equal access to success.

Substantively Appropriate Teaching

Educators have returned their attention recently to questions about the role of teachers' knowledge and skills related to content areas in effective teaching, trying to trace the relationship between what teachers know about content and what their students learn. Earlier studies identified no relationship (Grossman, Wilson, & Shulman, 1990), although common sense ruled that there had to be one. In addition, the proliferation of nationally standardized tests and international comparisons indicated serious deficiencies in student achievement in subjects covered in every classroom; this intensified interest in teachers' mastery of the subjects. Researchers are still investigating how much and what kind of subject-matter knowledge teachers at various levels need. They have begun to identify more clearly the ways in which teachers' backgrounds influence teaching and student learning. Of special interest is the observation that

> ...skills associated with the fourth 'R,' reasoning, are best taught in the context of the academic disciplines, where students acquire substantive knowledge as they engage in problem-solving tasks that motivate them to learn (Millman & Sykes, 1992, p. 39).

In early childhood education, the "content" of a lesson may be developmental, substantive, or both. While playing with cars and trucks at the sand table, children may be engaged by the adept teacher in conversation that builds their vocabulary and social skills and increases their understanding of neighborhood traffic. Six year olds listening to their teacher read a big book about dinosaurs could be learning about literary discussion, turn-taking, conventions of print, and natural history. In these settings, teachers' representations of underlying concepts can either facilitate or interfere with later learning. According to Stein (1991), the extent of a teacher's formal education and professional training is a reliable predictor of appropriate professional behavior.

In later grades, content assumes ever more importance. In the 1980s, a series of studies conducted at Stanford, Michigan State, and the University of Pittsburgh revealed several features of teachers' subject-matter knowledge

that influence the way they teach (Grossman, 1987; A. Reynolds, 1987; Shulman, 1986; Wineberg, 1987). First, teachers with deeper knowledge of their subject seem likelier to offer sound conceptual explanations and answer students' questions more ably. Second, teachers who understand the structure of knowledge in their discipline, its history and rules of evidence, and the relationships among topics seem to be more adept in presenting it to students. After reviewing these studies, Reynolds (1992) determined that

> ...teachers with limited subject-matter knowledge may instruct students in ways that overutilize procedural rules, which may contribute to student understanding that is structurally weak, because it is organized around relatively unmeaningful rules. Furthermore, these rules may be sowing the seeds of future misunderstandings (p. 17).

In addition, teachers' knowledge of subject matter is transformed by teaching; experience demonstrates how to approach lessons with different kinds of learners and how to connect lesson content to other areas of learning (Grossman, Wilson, & Shulman, 1990). Experience with content and with students of different types helps teachers weigh the value of various opportunities a lesson might present, such as whether to push for proficiency in a skill and come back to the conceptual underpinnings later or to pause long enough to make sure students learn the concept and put off skill development temporarily (Lichtenstein, McLaughlin, & Knudson, 1991). Making these decisions requires understanding a discipline thoroughly enough to know which opportunities for learning may arise regularly and which are one-of-a-kind events.

The intuitive conviction that knowledge of content is important for teachers and the increasingly dependable data supporting the conviction do not provide clear direction on how best to acquire knowledge. Studies of several four-year, five-year, and alternative certification programs as yet show no reliable evidence that having a lot of credits or experience in a subject equates with being able to teach it well or insightfully (NCRTL, 1992). Indeed, the argument is made compellingly by McDiarmid (1991) and others that both the content and the models of teaching in many academic majors is poorly adapted to lead prospective teachers to instructional adeptness. Mathematics is a good example; most of the mathematics courses required for a major shed very little light on the conceptual bases for the kinds of topics most mathematics educators will teach. Furthermore, the ways they are taught--lectures in large halls, assessments based on applications seldom reviewed in class, and grades curved because levels of mastery are often low--are not at all similar to methods desirable for use at the K-12 levels (if, indeed, they are desirable for any level). While it is possible, even likely, that a teacher candidate will learn more by taking more courses, there is little solid evidence that more coursework alone predicts conceptually better teaching. Some find paradoxical the evidence that even those who enter teaching from work that demanded very sophisticated content knowledge are not reliably competent in explaining it to young learners. Studies of the use of subject-matter expertise in teaching indicate that effectiveness depends in part on the ability to find the right kind of explanation--one that is accurate and conceptually adequate--and the right way to connect it to what students already know. On the other hand, the research on the development of

content knowledge suggests that for some teachers the conditions of work may support development of content knowledge well beyond what the extent of their formal coursework might predict.

Taken as a whole, the research on subject-matter knowledge suggests that pedagogical adequacy depends on having mastered a critical mass of content knowledge--a level of expertise without which no amount of technical skill can make a lesson work. In very many systems, mathematics classes provide numerous instances of otherwise effective teachers offering substandard lessons because they simply don't know enough mathematics to do better. On the other hand, the flow of content specialists from other fields into teaching--and almost immediately out again--has demonstrated that content expertise alone is insufficient for success. A doctoral-level researcher in physics or chemistry may not be able to teach a high school lesson as well as a skillful teacher with a masters degree in science or science education.

The Role of Field Experiences

Good teaching is applying the appropriate skills and knowledge in a given situation to promote student learning. It is a matter of developing both repertoire and judgment. Ideally, in the apprenticeship of field experience--in teaching, as in medicine, architecture, and law--candidates work on four important areas of professional development: technical skill, knowledge of general principles, critical analysis of practice, and purposeful action (Kennedy, 1987). Novices make choices, implement plans, reflect on outcomes, and improve competence. Studies of teacher education repeatedly confirm that candidates, school-based personnel, and teacher educators view field experiences as a central component of preservice education (Guyton & McIntyre, 1990). As the roles and responsibilities of teachers have expanded, the nature of the students has diversified, and the expectations for all students' achievement have been raised, structured and supervised induction programs have been added to the preparation programs for educators to assure their readiness to succeed as novices.

In the last decade virtually all teacher education programs have developed early field experiences lasting from 5 to 150 hours, in addition to student teaching; these early experiences usually include structured observations, tutoring, making instructional materials, and practicing assessment strategies. Of course, all programs also include student teaching, which lasts from 10 to 17 weeks, and involves about two-thirds teaching and one-third observing or participating, for the most part with the cooperating teacher present or very close (Guyton & McIntyre, 1990). In Kentucky, most programs offer substantially more than the required 150 clock hours of field and clinical experience, and most concentrate on experiences in actual classrooms (Blair, Georges, & Rush, 1990) rather than simulations.

Studies of field experiences reveal that they may significantly improve candidates' competence in insightful application of professional skills and knowledge or they may simply confirm the misconceptions that arise from candidates' twelve-year "apprenticeship of observation" as students. In her

review of research on field experiences, Darling-Hammond (1991) concludes that high-quality, focused supervision and opportunities for clinical practice improve candidates' performance in all dimensions of effectiveness, compared with candidates without such opportunities. This evidence is supported by practice in other professions that use internships for the same purposes as education (Darling-Hammond, Gendler, & Wise, 1990). The positive effects of preservice and induction-year internships that provide adequate coaching, help novices identify the conceptual lessons of practice, learn how to apply sound principles, and counter the developmental tendency to retreat from the early chaos into ineffective authoritarian methods are well documented. On the other hand, undersupported field experiences may well drive novices to less effective functioning than their academic training would otherwise permit. Studies have shown that

> ...unsupervised on-the-job experience is...insufficient to support teacher effectiveness. It can lead the teacher to adopt regressive and ineffective methods" (Darling-Hammond, 1991, p. 7).

Discussions about the value of field experience often center on whether it should be an apprenticeship in which the novice learns what the mature teacher knows--and thus, for better or worse, perpetuates existing conditions--or a growth-provoking experience for the novice, the mature teacher, and the college-based teacher educator alike. Research on traditional field experiences, where the novice is dropped into the world of school and visited only three or four times a semester by the college supervisor, shows that in such contexts the novice learns to reproduce what the cooperating teacher does--even if it is not consistent with other aspects of professional preparation nor supported by evidence of effectiveness. Furthermore, faced with the challenge of managing a complex environment, the novice often adopts counterproductive methods of assuring order at the cost of instructional effectiveness (Hersh, Hull, & Leighton, 1982). The process of selecting cooperating teachers does not typically involve evaluating their skills and knowledge in relation to areas emphasized in the preparation program, so in most programs, cooperating teachers know little about the methods and principles the student teachers are supposed to learn to implement. In one study (Blair, Georges, & Rush, 1991), survey responses showed that only half the responding programs evaluated either cooperating teachers or university supervisors, yet these two roles dominate the context in which a novice makes connections between preservice training and inservice conditions.

The evidence suggests that well-developed field experiences, in which novices get feedback related to sound principles of practice and opportunities to reflect on the meaning of lesson outcomes and student behaviors in a variety of settings, contribute significantly to the development of professional competence. Novices who participate in such experiences are generally given higher ratings on most measures of effectiveness and stay in teaching longer than those who do not. Poorly supported field experiences, on the other hand, seem to erode early effectiveness and lead to adoption of practices known (even to novices using them) as undesirable.

Unsupported field experience is a poor learning environment not only for novices, but also for mature teachers. Research on inservice teacher

education supports the perception of most teachers that short-term staff development activities have little discernible impact on teaching, even when followed by in-class coaching (NCRTL, 1992). Adoption of new strategies is a behavior change that "requires transformation of belief structures and knowledge in a manner that allows for situation-specific action" (Wise et al., 1984, p. 13). It also often requires transformations in roles, role interactions, and other aspects of the context of teaching. Successful adoption of new practices involves faculties in collaborations that take time during the school day, as well as in opportunities for training and discussion when students are not around. Few schools provide good contexts for teacher learning--crowded classrooms and tight schedules leave little room for coaching, discussing, and reflecting on new skills, materials, or procedures (Little, 1982).

The message from research on field-based learning for both novices and mature teachers is clear: The behavior changes essential to learning or adopting new methods of teaching are best supported by knowledge of the underlying principles and onsite assistance in implementation (NCRTL, 1992). Structured, supervised clinical experiences can provide scaffolding within which novices and experts alike learn which lessons from courses or workshops are relevant and how to adapt them to real-life situations. The value of field experiences is proportional to the extent to which they promote skill in applying techniques and principles or identifying areas for new professional learning. The inverse is also true: The extent to which experience does **not** facilitate or permit reflection on the application of new ideas will seriously limit the extent to which new behavior is adopted intelligently and productively. In teaching, as in other areas of human endeavor, inability to understand why a promising new idea fails on the first attempt often causes its premature rejection on the grounds that it is not efficient--even though efficiency may be better served in the long run by more thoughtful subsequent attempts at implementation.

TRENDS IN THE STATES

Certification

Teaching Certificate Titles

The Education Testing Service (ETS) keeps track of the kinds of certificates offered in the United States. As of April 1992, ETS had listed 44 certificate titles covering some or all of the grades from preschool through grade nine; 15 titles covering some or all of the grades from four through eight; eight titles covering grades six through 12; and six titles for adult educators. Fifty-one states have certificates that target the early childhood years; of these, 15 certify teachers for nursery through kindergarten only. Twenty-nine states offer special certificates for the middle grades (some or all of the grades from four to nine). Most secondary teaching credentials are subject specific rather than general.

Initial Certification Requirements

According to information collected by the American Association of Colleges for Teacher Education (1991), 17 states issue the first professional license on the basis of graduation from a teacher preparation program delivered as part of a four-year college degree; of these, 10 specify that the program must be approved by the state. In Florida, continuing certification depends on completion of a planned induction program within a year or two, which will also be the case in Colorado by 1994. Vermont plans to adopt a performance-based certification process. Thirty-one states base initial licensure on graduation from a teacher education program and achievement of qualifying scores on tests of general or professional knowledge, or both; 22 states specify that programs must be approved. In 15 states, receiving a standard or regular license requires successful completion of a planned induction program within one to three years of initial licensure. The induction programs include mentoring by individuals or teams of colleagues, coursetaking, and demonstration of mastery of skills. Whatever their contents, induction programs are generally coherent and individualized. Three states (New Jersey, Texas, and Virginia) base initial licensure on completion of minimal, undergraduate professional programs (e.g., 18 credits including student teaching) and achievement of qualifying scores on relevant tests. Virginia had an induction program, but funds were withdrawn after the first year because of budget shortfalls. Most states base continuing licensure or attainment of advanced licenses on accumulation of graduate or inservice credits in professional areas or subject matter, once the standard or regular certificate has been earned.

Early Childhood Certification

In an era of steadily increasing public school programs for children aged three to five, about two-thirds of the states require certification, or at least special training, for prekindergarten teachers. About 15 states have a license whose title indicates eligibility to teach down to the nursery school or preschool level. Illinois, Kansas, Michigan, Minnesota, and Vermont offer licenses that explicitly include children from birth to age five or eight (ETS, 1992; McMahon, Egbert & McCarthy, 1991). Sixteen states require a special license or endorsement for teachers in publicly supported early childhood education programs, which are offered widely in four of the states. One state, California, pays for teachers to acquire the supplementary training to add the endorsement to their license.

Beginning Teacher Evaluation and Induction Programs

Almost all states base continued licensure on beginning teachers' earning satisfactory evaluations in their first few years, and about half of the states set the requirements for these evaluations. About 10 states have what might be called "induction programs," which include routine mentoring and formative as well as summative evaluation; in all, 17 states specifically mandate some form of assistance for beginning teachers, although the range of

acceptable implementations includes many that are *ad hoc*, rather than programmatic. Several states either require local districts to provide induction programs or offer their own designs as options for districts to adopt. More than a dozen states require no induction year support; a few of these had well-developed programs that lasted only a year or two before funding dried up (Sclan & Darling-Hammond, 1992).

Minnesota and California have committed to developing comprehensive, performance-based certification programs that include an induction experience rich in substantive and procedural learning. Minnesota's goal for preservice programs is that they build on a stated philosophy and be "outcome based, programmatically coherent, research supported, and clinically focused...[and] include a yearlong supervised internship in a professional development school, as well as completion of statewide examinations of teaching knowledge and skills" (Minnesota Board of Teaching, 1992). At the college level, accreditation will rest on the institution's capacity to prepare teachers, rather than on the content of courses or curricula; that is, approved programs will be those whose graduates routinely meet agreed-upon professional entry standards. Certification will involve four stages: graduating from an accredited program, passing examinations of basic and professional knowledge to qualify for an intern license, completing an internship in a professional development school, and demonstrating proficiency in the skills and knowledge relevant to the area of certification. The process will be designed to facilitate candidate success, but each checkpoint will function as a real screen, holding back candidates who do not measure up to standards set after careful collaboration among stakeholders.

Two aspects of Minnesota's plans are novel. First, in the face of evidence that credit-counting, course-analyzing program approval processes have failed to assure a supply of candidates with the competencies essential for effective teaching, the Board of Teaching has shifted to a new approval process. Under the new rules, approval will depend on the degree to which programs produce graduates who are proficient in the basic skill and knowledge areas of teaching. Institutions that have innovative ideas about preparation can implement them without interference, using graduates' proficiency as the measure of effectiveness; similarly, the state will use program outcomes to determine accreditation. Second, recognizing the significance of an increasing body of evidence that well-supported, structured induction programs can have a strong, positive effect on teacher competence and longevity, the Board of Teaching will support a program model that provides good support for novices. By the time teachers earn full certification, the Board will have evidence of several kinds that they are skillful, knowledgeable, and ethical beginning professionals.

In California, the state has funded 37 pilot projects testing new models of induction experiences. These models experiment with different configurations of intern workload, mentors, and support from university staff. All nurture novice teachers' abilities to communicate about professional concerns, reflect on the meaning of their experience, engage colleagues as helpers, evaluate their own performance, interpret research findings, and make decisions that facilitate student success. The goal of this period of experimentation is to identify the best ways to promote beginning teacher

competence and the most valid and reliable set of performance indicators to use as the basis of licensure (Sclan & Darling-Hammond, 1992).

Teacher Recertification

California is one of the few states that has required teachers to retrofit their training to match new demands of public school classrooms. To cope effectively with an unparalleled influx of language minority students, the state requires teachers in schools with significant proportions of such students to acquire a language development endorsement on their regular credential. This endorsement is based on performance on state tests of ability to recast lessons from the regular curriculum into forms and words that are more understandable to students whose native languages are other than English. Teacher education units offer graduate or staff development programs in this area, and many schools arrange for faculty to participate in them; however, competency--not credit--is the basis for the endorsement. In addition, teachers with standard elementary certification (which covers grades K-8 or 1-8) will soon be required to add an early childhood endorsement if they wish to teach in the expanding nursery and prekindergarten programs. The state will pay the cost of this retraining.

Most states require regularly certified teachers to earn a preset amount of graduate or inservice credits as a condition for maintaining licensure; a few states require teachers to earn master's degrees within a certain number of years of initial certification.

National Professional Standards Development

Two groups with broad representation from the education community have taken on the task of identifying professional standards to define the goals of professional preparation and development programs--the National Board for Professional Teaching Standards (NBPTS, referred to hereafter as the National Board) and the Interstate New Teacher Assessment Support Consortium (INTASC). The goals of the National Board are to identify high standards for what experienced teachers should know and be able to do and to certify their expertise through efficient, valid, and reliable assessments. In addition, the National Board supports related education reforms that improve student learning. Its work centers on development of policy and procedures that lead to recognition of highly effective professional teachers, whom they characterize as:

- committed to students and their learning,
- knowledgeable about the subjects they teach and how to teach those subjects to students,
- responsible for managing and monitoring student learning,

- o able to think systematically about their practice and to learn from experience, and
- o active members of learning communities (NBPTS, 1991).

In formulating standards and certification areas, the National Board emphasized four priorities: fairness, match with the education system, parsimony, and support for the dimensions of excellence identified by the Board as the basis of effectiveness. In defining effectiveness, the National Board assumed that a common core of professional knowledge applies to all teaching, that some aspects of human development and pedagogy are relevant to a narrow range of students, that each subject area involves some distinctive pedagogical dimensions, and that teachers need depth as well as breadth of knowledge.

In light of these considerations, the National Board identified six major levels of certification, most with associated specialties (NBPTS, 1991). These are defined in Table 2.

In consultation with practitioners as well as researchers and other related professionals, the National Board has begun to identify the skills and knowledge of excellent teachers in each level and specialty. One of its major efforts continues to be research and development of assessment strategies that meet three criteria. First, they must measure performance related to the

Table 2

National Board for Professional Teaching Standards Certification Levels and Specialties

Levels	Specialties
Early Childhood *Ages 3 to 8*	Generalist
Middle Childhood *Ages 7 to 12*	Generalist, English/language arts, mathematics, science, social studies/history
Early & Middle Childhood *Ages 3 to 12*	Art, foreign language (Spanish, French, others), guidance counseling, library/media, music, physical education/health
Early Adolescence *Ages 11 to 15*	Generalist, English/language arts, mathematics, science, social studies/history
Adolescence & Young Adulthood *Ages 14 to 18*	English/language arts, mathematics, science, social studies/history

Table 2 (cont'd.)

Levels	Specialties
Early Adolescence & Young Adulthood *Ages 11 to 18+*	Art, foreign language (Spanish, French, and others), guidance counseling, library/ media, music, physical education/health, vocational education (agriculture, business, health occupations, home economics, and industry/technology)

standard validly and reliably.* A high score on the assessment should be a real indicator of ability. Second, they must be cost effective; the cost in time and money to conduct the assessments must be reflected in the amount and quality of information they produce. Third, they must have a positive impact on teaching practice, school organization, the quality of the teaching force, and the public's respect for the profession (NBPTS, 1991). The intention of the National Board is to create a system of voluntary certification, available to teachers with a college degree and three years of teaching experience, who desire to document the extent of their professional competence.

INTASC is a similarly representative group composed of educators from 16 states (including Kentucky), the American Association of Colleges of Teacher Education, the National Council for Accreditation of Teacher Education, the American Federation of Teachers, and the National Education Association working under the aegis of the Council of Chief State School Officers. Their goal is to establish standards and assessment strategies comparable to the National Board's to use at the state level for initial licensure, and they are working from the same certification framework (i.e., levels and specialties). While the states' individual educational missions may make some areas of

*In assessment, one definition of reliability is the extent to which a test yields the same results on repeated attempts, so that the score cannot be considered a fluke; validity is the extent to which a test measures the quality it is supposed to measure. In any kind of performance assessment, the goal is to develop a test that is sufficiently reliable that if candidates took alternate, equivalent forms on two different occasions, they would earn the same score; and sufficiently valid that a low scorer would, in fact, be unable to perform well in real-life circumstances, while a high scorer would perform quite competently. Multiple-choice tests such as the National Teachers Examination (NTE) are usually very reliable but have limited validity, because the format of paper-and-pencil testing limits the match between real-life performance and test performance.

certification more relevant than others, each can benefit from having a pool of jointly established standards and assessment strategies from which to draw their distinctive practices. The process of establishing standards and identifying assessment strategies is time-consuming and expensive. The members of INTASC hope to improve quality and reduce costs by collaborating on this activity, which will ultimately make it possible to shift to certification policies based on performance assessment rather than less effective traditional strategies.

The Status of Teacher Assessment

Virtually all the states that include assessment as part of initial certification use the paper-and-pencil National Teachers Examination (NTE) or a state-developed test of comparable nature to screen candidates. Virtually all who participate in such screening lament its limitations--too many unqualified teachers manage to pass, and some qualified teachers fail. Other professions, such as law, architecture, and medicine, have overcome the problems with each kind of assessment by creating what Shulman (1988) calls "a union of insufficiencies" (p. 36)--a comprehensive process that achieves creditable validity and reliability by using several different strategies. In the Stanford Teacher Assessment Project (TAP) and the California New Teacher Project (CNTP), educators have been evaluating the utility of several assessment packages, including paper-and-pencil tests, performance events, and portfolios.

Working with experienced teachers, TAP researchers investigated several portfolio models. Their goal was to develop a portfolio that reflected the complexities of teaching, in order to show what teachers can do, how they learn from their work, and what professional insights they bring to it. For each subject area in the project, they listed critical teaching tasks that captured a wide and representative array of skills and knowledge. For each task, they identified types of evidence that could be used to document competence. Through trial and error, they discovered the strengths and limitations of student work samples, teacher journals, tests, lesson and unit plans, videotapes, audiotapes, photographs, and diagrams. In order to balance the need to create records that could be compared across candidates and raters with the desire to provide opportunities for teachers to showcase their unique contributions to learning, TAP specified the form and procedures to guide entries but left content up to the teachers. For instance, teachers were required to submit a certain number of documents showing how they assessed students' entry-level knowledge, but they could choose any type of assessment strategies or documents. Development of portfolios was a collaborative task, completed by teachers with the help of colleagues who were encouraged to provide feedback and coaching to make the portfolios as valid and complete as possible.

The California New Teacher Project (1992) set forth a framework listing knowledge domains and subdomains and a set of performance indicators for each, intended to suggest directions for both professional development and assessment of beginning teachers' knowledge and skills. For each domain, a

limited array of assessment strategies is appropriate; for instance, demonstrating mastery of some aspects of subject knowledge can be done with paper-and-pencil tests, but demonstrating ability to design assessments and make sense of their results may require portfolio or observational data.

ETS will soon launch the PRAXIS Series, a three-part, multidimensional test of academic skills, subject-matter knowledge, and classroom performance. PRAXIS I, a computer-delivered Pre-Professional Skills Test (PPST), assesses the basic skills most relevant to the work of beginning teachers. ETS offers a correlated computer-based remediation program that provides instruction and practice on skill deficiencies revealed in the PPST. PRAXIS II tests subject-matter knowledge in multiple-choice and constructed-response formats. PRAXIS III uses trained local observers to conduct performance assessments using frameworks that reflect the state's licensing requirements. The format is based on the clinical supervision model, with pre- and post-observation interviews. The PRAXIS Series was developed to overcome the validity problems of the NTE without sacrificing reliability.

The National Board, the Center for Research on Educational Accountability and Teacher Evaluation (CREATE), and researchers at Michigan State University, among others, have been developing and testing prototype assessment instruments and protocols to support the movement toward performance-based certification. In addition to paper-and-pencil tests and portfolios, they are working on performance events that may have greater validity than multiple-choice tests and greater reliability than portfolio assessments. In this approach, a candidate's behavior in a circumscribed situation is evaluated according to a standard rubric. In some models, the observation takes place in a regular classroom during a fairly predictable, routine event; in others, the situation is standardized by using actors or laboratory settings.

To summarize, the use of quality control measures--teacher education program approval, induction programs, more rigorous and databased professional evaluation systems, and formal graduate course requirements--to stimulate improvement of skills and knowledge in the teaching force is generally accelerating. Interest in new forms of assessment is heightened by increasing evidence that strategies now in conventional use leave a lot to be desired in their validity and show little ability to screen effectively for, or cultivate, desired teacher characteristics. Some state departments of education (e.g., Minnesota, California), some professional groups (the National Board, INTASC), and some research centers (CREATE, Far West Lab) are taking the lead in developing assessments that tighten the connections between states' explicit educational goals and teachers' demonstrated proficiency in helping students achieve them.

The Unevenness of Reform

Reviews of programs launched by local districts, state agencies, higher education institutions, and community groups reveal inconsistencies in the pace, nature, and intensity of reform efforts in various sectors of states'

education communities that result in contradictions within systems. For example, in Virginia the legislature trimmed down the size of four-year undergraduate teacher education programs to relatively few credits, but approved creation of an innovative five-year program and a comprehensive, thoughtful induction program. A year later, funding for the induction program was lost in budget cuts, and the abbreviated teacher education program was left without the arguably important support of its post-graduate internship. In Louisiana, the internship program was shut down after a year for remodeling, and implementation of the newly adopted teacher competency tests resulted in suits against the state. In Arizona, the state requires two annual formal evaluations for beginning teachers during each of their first three years and offers a state-funded residency program for novices, but their formal certification is contingent on neither. In Chicago, with expensive reform projects that are continuous front-page news, uncertified substitute teachers are still permitted to teach fulltime for long periods. Despite evidence about the value of professional education, New Jersey and Maryland adopted truncated alternative certification programs based on intensive, several weeks' preservice training and predicated on the assumption that careful supervision could assure skill development while the candidates were teaching fulltime. In fact, few districts have the personnel to provide supervision of the extent or quality necessary, and program attrition rates are high because ill-prepared candidates are undone by the difficulties of teaching in districts desperate enough to recruit uncertified teachers. The state-funded teacher education programs in Corvallis and Eugene, Oregon, had developed and implemented pioneering projects in the Holmes Group teacher education reform initiative before legislative cuts in higher education budgets caused both university presidents to shut down teacher education programs altogether.

Improving effectiveness of organizations as large and multidimensional as state education systems takes time, commitment, and money. Among those trying to meet the challenge of serving all their children despite severe budget shortfalls are Connecticut, Minnesota, and California. Those states have initiated campaigns involving all members of the education community and attacking problems at all levels of their systems. Connecticut has done ground-breaking work in teacher assessment and induction. Minnesota has adopted open enrollment policies and followed up with activities designed to make all public schools equally effective; its efforts include reform of teacher education, induction, and certification. Despite dramatic and seemingly endless funding cuts, California has maintained its leadership in developing innovative preservice and inservice education programs to support its goals. Although some states have made great strides, few have undertaken so thorough a reconstruction of the educational system as Kentucky. While Kentucky can learn from the work of other states, none can provide a complete description of the road to success. However, their struggles can teach important lessons about how long it may take to achieve KERA's goals and what kind of obstacles Kentucky should prepare to overcome.

POLICY RECOMMENDATIONS

Realizing the mission established for the Kentucky Education Professional Standards Board requires that a powerful system of licensure standards be put in place and monitored. The system will serve at least three purposes:

- o to provide quality control at the point of entry into teaching,
- o to enhance and assist the learning of teacher candidates, and
- o to direct the efforts of inservice teachers toward the new learning goals for the Kentucky education system.

Additionally, the Board will want to ensure that a diverse pool of talented individuals be recruited to teaching. In pursuing these broad purposes, the state should take steps to insure that the Board can exert strong leadership around this mission; and, through the work of the Board, to create a strong system of standards. The following nine recommendations serve these objectives.

Recommendation 1: Develop a Statewide Framework of Performance Standards for Teaching

The first task for the Board is to create or adopt a set of statewide standards that will serve as the basis for initial and continuing teacher education and teacher assessment. The timing is propitious for the Board to undertake this foundational task, because considerable national attention is currently being directed to this topic. The standards should establish generally and for the various categories of specialists what an accomplished entry-level teacher should know and be able to do. Furthermore, these standards should be explicitly linked to the valued outcomes in Kentucky, with attention paid also to other authoritative content standards under development by such professional groups as the mathematics, history, English, and science educators.

The Board will want to study the parallel efforts in standard setting that are underway, including those by the INTASC group for the Council of Chief State School Officers, the National Board, the National Association of State Directors of Teacher Education and Certification, and other vanguard states. However, the key issue will be compatibility with the vision of teaching and learning established by KERA and the efforts of such bodies as the Council on School Performance Standards, with which the development of these standards should be coordinated.

The Board will also want to consider a range of conceptual issues in developing a teaching standards framework that is based on performance or outcomes and is able to inform teacher preparation. Some of the critical issues that require the Board's careful study and widespread consultation with national experts and Kentucky educators are described below.

Delineating of levels or stages of competence. Standard setting in teaching is moving toward conceptions of beginning and advanced competence that suggest the possibility of identifying what should be learned early as a basis for initial practice, what should be assessed at various stages in the career, and what should be acquired subsequently over the course of a career as part of continuing professional development. Empirical research, particularly within the program of "expert/novice" studies, suggests developmental principles in teaching. The National Board is spearheading work on advanced standards, but these developments are still in the formative stage, and widely accepted principles for the staging or sequencing of standards have yet to be worked out.

Creating role-based and classroom-based standards. The most common basis for teaching standards resides in the duties and tasks framed by classroom instruction. A second basis, however, is a conception of the teaching role to include a broader range of professional responsibilities outside the classroom, in relation to parents, school-level decisionmaking, curriculum development, interdisciplinary teaching, and other matters. The question concerns how to frame role-based standards and how to sequence them in terms of initial and advanced competence. Clearly, certain leadership roles in schools will be best managed by experienced teachers, but the state may support some role-based standards for beginning teachers as well.

Including the disposition to conduct inquiry among characteristics of professional effectiveness. Teaching involves the development of a repertoire of skills and techniques regarding such matters as classroom management, cooperative learning, teaching reading and writing, and so on. Considerable technical knowledge has accumulated around these matters that can be described in standards and subsequently assessed. But the research on teaching and on learning to teach also describes the necessity for teachers to be learners, to conduct inquiries, and to develop dispositions toward reflection. Much that is central to accomplished teaching has not been codified in technique. In particular, adapting instruction to cultural and other characteristics of learners is an aspect of good teaching widely regarded as centrally important but uncertain as to technique and method. State of the art advice to teachers on this topic urges that they must learn about their students through local inquiries of their own. Consequently, standards must reflect concern with teachers' central disposition to be inquiring as well as with their technical proficiency.

Balancing and integrating of generic and situation-specific knowledge in teaching. The process-product tradition of research on teaching yielded useful results in the form of generic teaching skills that were intended to apply across such contexts as grade level and subject area. This body of research undergirded many of the early state assessment frameworks, such as those adopted in Florida and Georgia. However, within the last decade the research on teaching has produced more finely contextualized accounts of teaching that emphasize specific, not generic, approaches. For example, the research on pedagogical content knowledge stresses teachers' command of subject-matter knowledge and its employment in teaching. The socio-linguistic tradition emphasizes teachers' knowledge of students' language use. And developmentalists stress the age level of children and the idea of

"developmentally appropriate" instruction. Standards must balance and account for both general and situation-specific forms of knowledge and skill in teaching.

Relating standards for teaching to learning outcomes. An age-old yearning is to ground teaching standards in the production of learning outcomes, but systems that attempt such linkage have not proven workable. Nevertheless, accountability pressures demand that teaching standards include some account of the relation between teaching performance and student learning. Kentucky policymakers rightfully may ask whether the implementation of a particular set of teaching standards will produce the kinds of student learning envisioned in KERA. One screen to apply to the development of teaching standards, then, will be correspondence with state learning outcomes. It is not fully possible to rationalize a set of teaching standards with reference to a set of learning outcomes, but the relationship should be open to scrutiny for sources of compatibility and inconsistency.

Recommendation 2: Establish a System of Staged Entry to Teaching That Includes Assistance and Assessment at Each of the Stages

In keeping with KERA's emphasis on a professional practice model of schooling, the state should follow the lead of other professions in creating a system of staged entry to teaching. The aim of such an approach is to introduce a sequence of liberal and professional studies for teachers, together with assessment points designed to demonstrate each candidate's mastery of the relevant knowledge and skills. The Standards Board might examine the approaches taken by other states but the basic features include the following.

Examining the basic skills required for entry into a teacher education program. This test should be taken prior to or during the second year of college, and candidates should receive assistance and multiple opportunities to pass the test.

Examining candidates' subject-matter knowledge at the end of their college education. With respect to this stage of assessment, several difficult choices and options must be considered. The difficult choices involve the subject-matter knowledge required for early childhood, elementary, and other non-specialized teaching positions. One recommendation worth considering is that all teachers must possess knowledge in depth of at least one school subject, such as mathematics, history, or biology, together with rudimentary knowledge of the other school subjects. The rationale is that teachers must understand what it means to know a subject well as a basis for their continued learning across the full range of school subjects. Consequently, their college education should supply in-depth learning in at least one discipline, together with survey and other general courses in other disciplines and in inter- and cross-disciplinary studies, as a basis for curricular and instructional knowledge in teaching.

An important option at this stage of entry concerns whether to test for subject-matter knowledge itself or to include what is now referred to as pedagogical subject-matter understanding as well. The current convention is to concentrate on knowledge of subjects, without reference to pedagogical implications. But if Kentucky seeks to encourage more integrated liberal and professional studies for teachers during the undergraduate years, then tests that join knowledge of subjects and pedagogy are desirable.

A second important option concerns whether (and when) to include an examination of discipline-based professional knowledge acquired through teacher education coursework and field experiences. Such knowledge includes attention to topics such as human development and learning, the role of schools in society, the philosophical bases for selection of learning outcomes, and other issues. This is the content covered in foundational courses in teacher education (as distinguished from liberal arts coursework and methods of teaching). Such knowledge is problematic in its relation to performance. To some, propositional professional knowledge is not evidently related to effectiveness in the classroom, and so should be downgraded in importance. To others, however, a base of such knowledge is an important requisite to wise decisionmaking in teaching because it provides a range of theoretical considerations that bear on such practical matters as the selection of curricular materials, the choice of learning outcomes, the response to culturally diverse students, and other aspects of teaching.

Related to such knowledge is the question of when to test for it. One option is to include a test of professional knowledge at the conclusion of college, alongside of or in conjunction with subject-matter examinations. A second option is to embed tests of the professional knowledge base in the set of assessments conducted around an internship. The first option ties professional knowledge to the curriculum of teacher education and emphasizes its acquisition. The second option ties professional knowledge to classroom decisionmaking and emphasizes its application in particular context.

At the successful conclusion of this stage, candidates should receive a professional, time-bound license to teach.

Creating performance-based assessments that occur during and at the conclusion of a yearlong, school-based internship. To demonstrate that candidates can apply knowledge and skills under real teaching conditions, an internship is required that serves both to extend teacher education into the first year of supervised teaching and to provide a performance base for multiple, complex assessments of teaching. These assessments are designed to capture candidates' abilities to manage successfully the primary duties of teaching: planning and implementing lessons and units of instruction; establishing a classroom learning community that includes attention to behavioral norms; representing concepts and ideas in multiple, culturally appropriate ways to diverse students; evaluating student learning; employing particular methods of teaching, such as group work, lecturing, peer tutoring, and subject-specific techniques in such areas as reading and writing instruction and particular school subjects. Upon successful completion of the internship and the correlated assessments, the candidate would receive a permanent license to teach that would be renewable on a regular schedule.

Linking continuing education requirements to renewal of the teaching license. The state should establish requirements for license renewal that encourage teachers to continue their professional development. Here, too, there are a variety of options to consider. Most states create flexible menus of offerings provided by school districts, universities, or the state through institutes or regional service centers. These arrangements make professional development accessible, but often result in weak treatments that are unrelated to the systematic development of teaching expertise.

One option is to create district-level professional development councils that oversee the creation of individual growth plans for teachers--plans that require some systematic assessment of needs together with oversight by peers and administrators. Vermont currently has such councils in operation. Another option is for the state to aggressively target continuing education opportunities to the new goals for Kentucky education via work with state universities and school districts, together with use of incentives and regulations to provide firm direction for the course and content of professional development. The model developed, however, should attempt to balance the individual's self- and peer-identified needs for growth with the state's priorities.

Recommendation 3: Undertake Development or Adoption of the Complex Assessments Needed to Implement a Staged System of Licensure

The first choice facing the state will be to adopt assessments already developed, with or without modification, or to engage in some local development. For example, ETS will soon have a system of assessments that roughly parallels the stages suggested above. The new PRAXIS series may serve Kentucky's interests; in this case, a simple adoption decision would be in order. But other choices exist as well, including attention to compatibility with the assessments developed by the National Board for Professional Teaching Standards and to the developmental work conducted by the Far West Lab for the California New Teacher Project.

The options include such procedures as structured or semi-structured classroom observations; portfolios in which student teachers and interns assemble instructional materials (lesson plans, homework assignments, letters to parents, and teacher-made tests, for example), student work samples, videotapes of teaching, and other artifacts and indicators of performance; assessment center simulations and interviews, possibly coupled with portfolio entries; and constructed-response tests of knowledge and skill. The aim in selecting, modifying, and/or developing assessments will be to ensure the use of multiple methods with offsetting strengths and weaknesses that can tap both the mastery of knowledge and its application in the work of teaching.

Recommendation 4: Strengthen and Integrate the Internship into the New System of Teaching Standards

A number of states currently require intern experiences for entering teachers; no state has yet fully developed an effective internship, however,

and Kentucky has the opportunity to be the first. A set of design and implementation decisions must be considered. One concerns whether the Board should immediately adopt a single, new, expanded, statewide internship model or sponsor the piloting of a range of models as a basis for statewide adoption at a later date. Other states have already engaged in such piloting, and Kentucky could assemble and draw on this developmental work to establish a model of choice. For example, the California New Teacher Project supported multiple, local projects, and then mounted a cross-site evaluation. The reports from this multisite, multiyear study, together with the experiences of such states as Connecticut, provide an empirical basis for a range of specific recommendations regarding the implementation of statewide internships (California State Department of Education, 1992; Darling-Hammond, Gendler, & Wise, 1990). The Board should consult these precedents and then build on the promising start already launched with the Kentucky internship. A partial set of specific recommendations, based on these precedents, would include the following:

- An intern director should be identified for each district or consortia of districts, be affiliated with a university, and have overall responsibility for managing the intern arrangements.

- The Board should broker collaborative arrangements between universities and school districts to join university faculty, school administrators, and experienced school teachers in developing the infrastructure for successful intern programs that are dedicated to the development of new teachers capable of teaching to Kentucky's ambitious learning goals.

- A cadre of master or mentor teachers should be identified to work closely with the interns. The Board would be responsible for developing procedures and funding for implementing the following elements:

  (a) selection procedures for mentor teachers;
  (b) training for mentors;
  (c) ongoing support for mentors, including opportunities to meet and confer with other mentors;
  (d) provision of released time for mentors to work with interns;
  (e) intern teaching assignments that are not overly onerous;
  (f) opportunities to intern in more than one site in order to learn about a range of students and communities; and
  (g) placement of a critical mass of interns and mentors in particular schools that are specially dedicated to the support, assessment, and preparation of beginning teachers.

Recommendation 5: Retain the Present, Three-Tiered Regular Education Framework for Certification, But Extend the Lowest Tier to Include Preschool (i.e., Targeting Ages 3 to 8 or 9); Offer K-12 Special Education Credentials Only for Serious Disabilities (e.g., Hearing, Speech, or Vision Impairments and Multiple Disabilities); Establish Endorsements for Areas Within Each Tier; and Make Special Education for Minor Disabilities (e.g., Learning Disabilities) an Endorsement Area Within Each Tier

This certification system (with adjustment to include preschool levels) can accommodate the different demands of the general population of students at each level, as characterized by specialists documenting their developmental needs. It also accommodates the staffing patterns of Kentucky's proposed grade configurations, permitting both specializing and a practical degree of flexibility. Furthermore, the tiers are roughly comparable to the categories adopted by the National Board and INTASC: Early Childhood, Middle Childhood/Early Adolescence, Adolescence, and Young Adulthood. If those organizations develop standards and assessments for the comparable certification areas, Kentucky can take advantage of them. Major public school programs are planned for children no younger than three. There is little evidence that fundamentally different training is necessary for teachers of most children who qualify for special education because their disabilities are relatively minor. (However, additional classroom support may be needed for regular teachers to deal with those children in addition to other responsibilities.) Table 3 shows suggested endorsement areas to match Kentucky's education goals and grade configurations (the scope of this report did not include areas such as physical education, media, art, or music).

Table 3

Certification Levels and Specialties Recommended for Kentucky

Levels	Specialties
Early Childhood Education	Preschool special education Ungraded primary Elementary special education (K-12)
Middle School	Generalist (self-contained classes, grades 4-6) Content specialist (departmental or teamed, grades 4-9) Intermediate special education (grades 4-9)
High School	Content specialist (departmental, grades 9-12) Secondary special education (grades 9-12)

To qualify for a particular endorsement, candidates would have to demonstrate attainment of the standards of basic competence in the area: for example, passing a test of content knowledge. (See also previous sections for discussion of other assessment options.) The experience of preparing for an endorsement could provide opportunities for candidates to extend their own knowledge in the targeted areas and their skills in stimulating student learning. Earning an endorsement would be part of induction and subsequent continuing education experiences.

Recommendation 6: Establish a Combination of Recruitment Strategies and Procedures for Exception to the General Licensure Regulations and Monitor Such Exceptions Closely

Nearly all states have developed special recruitment strategies and procedures for exceptions that account for diverse paths of entry into teaching and for imperfections in the teacher labor market. For example, in the interest of providing a robust pool of talent for teaching, states will want to attract recent college graduates who have majored in education; recent college graduates who have not majored in education; midcareer changers who seek to enter teaching after embarking on a first career; out-of-state recruits who have prepared to teach under rules different from Kentucky's; and former teachers who wish to reenter the workforce. Furthermore, most states encounter both spot and chronic shortages of qualified teachers. Shortages, for example, typically occur in mathematics and science teaching, in teaching in inner city and rurally isolated schools, and for some specialist areas, such as bilingual education. To meet shortage situations, states may establish special recruitment lures and/or exception policies such as the issuance of emergency credentials or limited recourse to teaching outside endorsement areas. The Board must develop both recruitment and exceptions policies. A range of options are available, but some general considerations should guide policy choices. These considerations are described below.

Based on careful study of teacher labor market conditions in Kentucky, the Board should develop a set of recommendations for targeted recruitment strategies. Understanding the labor market is critical to making informed targeting choices. The strategies might include loan-forgiveness programs, scholarship and fellowship programs in shortage areas, university-based recruitment centers, high-school-based "future teachers" clubs, teacher-training programs that encourage current teachers to obtain extra endorsements in shortage specialties, and junior college programs that boost the capacity of initially marginal students and attract them to teaching.

The Board should encourage the development of alternate-route programs within universities, targeted to major segments of the teacher labor market. In addition to the mainstream of undergraduate education majors who will enter teaching, universities might develop post-graduate programs either in the context of master's degrees or for purposes of licensure that appeal to recent noneducation college graduates, including those from liberal arts colleges that do not offer teacher education as an undergraduate major; and midcareer

alternate-route programs that appeal to individuals seeking to make the transition from other careers into teaching. Evidence from other states indicates that alternate-route programs are especially successful in attracting academically qualified minority candidates (Natriello & Zumwalt, 1992). However, the Board must ensure that each of the routes into teaching sanctioned by the state will produce candidates capable of meeting the full range of performance standards implemented through the staged system of assessments.

Any teachers who have not met the full set of licensure standards established by the Board should be designated by a title such as "instructor," as distinguished from "professional teacher," to indicate that the individual is not fully qualified to practice independently in the classroom. Individuals so designated should be supervised by mentor or master teachers who are fully qualified in the relevant endorsement area and should be allowed to maintain the "instructor" status for only a limited period of time, with the assumption that if they wish to continue teaching in that area, they must arrange to meet the full state requirements. In this manner, the state may acknowledge imperfections in the labor market that prevent a full supply of qualified teachers for every school, yet maintain teaching standards. Associated with this policy, the state may issue irregular and limited credentials and sanction some teaching out of one's certification specialty, but insist on the importance of the state standards. Furthermore, the Board should maintain a careful and up-to-date database on the exceptions for monitoring and review purposes.

For out-of-state applicants, the Board may wish to explore reciprocity with other states as a first line of standard setting. For applicants from states without such agreements, the Board must establish a process of credentials review coupled with requirements to meet performance standards as established within the licensure system. This may mean that individual candidates must take additional course work and pass one or more of the staged set of assessments that the state has in place.

For teachers returning to the workforce with a valid teaching license, the continuing education requirements should constitute the appropriate quality control standard. The candidate should be required to submit to the relevant state or local agency a plan that will guide professional development with reference to Kentucky's new goals for learning.

Recommendation 7: Initiate a Review of the NCATE Unit and Program Accreditation Standards for Their Compatibility with the KERA Vision, Then Choose One of the Four Available Options for NCATE Involvement

Most states have program-approval standards for teacher education, but the standards and their implementation are not well regarded. State program approval does not constitute serious quality control because states do not support the capacity to make quality judgments about professional preparation programs. The agency currently in the best position to make such judgments is NCATE. This national, voluntary accreditation agency has recently revised its

standards, has instituted a careful program for training site visit teams, and has cooperated with professional associations in creating program as well as unit standards that are the most stringent in the country. Following the reform of their procedures, NCATE has reviewed 259 institutions nationwide. In the most recent round of reviews, NCATE denied accreditation to 14 percent of the institutions. To avoid duplication, the state should consider adopting the NCATE standards for program approval and then participate actively in the movement to establish a strong, national system of voluntary program accreditation. This is the model that most other professions have followed, because assessment at the candidate level alone has proven an insufficient guarantee of quality and accountability. A full set of standards will include both program and individual performance standards, and Kentucky should invest in such a system.

Recommendation 8: Monitor the Demographic Characteristics of the Teacher Work Force and Develop Policies That Ensure the Recruitment and Preparation of a Diverse Supply of Teachers

States have a stake in ensuring that the teacher work force is at least as diverse as the student population. Teachers not only impart knowledge to students, but they also serve as role models and exemplars of educated persons. It is important that states recruit a diverse work force for two reasons. First, students of diverse racial and ethnic backgrounds should be exposed to role models with whom they can identify. Second, in a multicultural society, all students should learn from a wide variety of adults who together model and exemplify a learning community that celebrates and draws on cultural and other forms of diversity.

Practically, this policy commitment means that the Board should collect and update statistics on the demographic characteristics of the work force and should track the effects of licensure and training requirements on work force diversity. If, as is likely based on experience in other states (Murnane et al., 1992), licensure and training requirements systematically reduce the numbers of minority candidates to teaching, then the state should institute targeted recruitment and assistance efforts designed to increase the flow of minorities into teaching, such as those described above.

Recommendation 9: Seek Adequate State Support So That the Board May Aggressively Pursue Its Mission to Develop a System of High-Quality Standards for the Teaching Profession

Kentucky has taken a bold step in establishing an autonomous standards board that will champion the professionalization of teaching in Kentucky. Such is clearly the intent of KERA. Gone are the days when an underfunded, understaffed, and administratively subordinate unit within a state department of education could reasonably oversee the development of teaching standards. The expansion of the knowledge base in teaching, the increasing public accountability pressures, the demands for higher forms of learning that call forth more ambitious conceptions of teaching, the explosion of standard-setting efforts, and the research and development of new forms of assessment

in teaching all point to the necessity of a fully staffed, adequately funded, autonomous professional board at the state level that can oversee the development of teaching standards. The aim of such a board is not merely to preside over a limited bureaucratic process of licensing teachers to a lovest common denominator status. It is to exert leadership in the formation of professional teaching standards in pursuit of the new learning mandated by KERA. The single most important resource that the state can devote to the new learning is a well-prepared and fully qualified work force. There must be a state-level agency whose long-term mission is to cultivate this necessary resource and whose staff and funding are sufficient for the task.

CONCLUSION

The foregoing recommendations indicate an ambitious agenda ahead. Experience in other states suggests that when the symbolic aspects of standard setting, such as passage of reform legislation, are not supported fiscally and administratively, then little or no change results in the system. Too many states have established ambitious goals without providing the means to realize those goals, so they remain empty promises. Kentucky must support the work of the Board in pursuing these recommendations if it is to succeed in creating a public school system that provides equitable and worthwhile learning opportunities for all students. There can be no substantive reform without large-scale and high-priority investment in the teacher work force that is essential to achieving KERA's goals.

The arrangement in place appears problematic. The Board's resources are not well matched to its comprehensive mission. The extent to which new initiatives can be developed, launched, monitored, and evaluated properly is limited, because there are not enough staff members to manage both ongoing and new programs. The most cost-effective reform strategy is to invest in developing good plans, which requires human and financial resources beyond those needed to maintain order during the planning stage. A vitally important aspect of standards development will be the conduct of widespread conversations with teachers and other stakeholders throughout the state, so that understanding and ownership accompany this promulgation of new standards. Other states, such as California, Connecticut, and Vermont, have successfully orchestrated such widespread consultation and conversation among the stakeholders. If the effort to set standards is perceived as a top-down, bureaucratic maneuver that is unconnected to the experiences of educators in schools, then the spirit of the standards will never be realized, nor will their potential to direct teaching and teacher education productively. Under current conditions, funds for research and development and for the statewide consultations necessary for policy development and implementation must be diverted from other activities that are still essential, even though they may ultimately be replaced by new programs. To achieve the goals implicit in its mandate from the legislature, the Board must have the staff and budget to operate responsibly and effectively. The present limits of staffing and funding seriously constrain the Board's ability to make the changes it was commissioned to make.

The Board needs an adequate budgetary line, a professional staff of appropriate size and composition, a developmental agenda, and a capacity to orchestrate widespread consultation throughout the state. If the state is not forthcoming with support for the Board and its recommendations, then the Board will be unable to lead change. To achieve its mission, the Board must negotiate funding for improving components of the teacher preparation and certification system. Among the important immediate efforts should be using the knowledge gained in first years of implementation to improve the internship; developing and implementing complex, performance-based assessments; developing a work force indicators system that gathers statistics on the labor market, the qualifications of teachers, the demography of the workforce, and related matters; and designing effective recruitment strategies. The other recommendations advanced in this report rest on these governance and capacity-building measures.

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